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ABSTRACT

Measures of background characteristics, school performance, and tested achievement were analyzed for four race-by-sex samples of 3rd graders who were known to have later become high school dropouts or graduates. Results showed that as early as five to eight years before leaving school, dropouts differed significantly from graduates in age, tested reading and IQ level, and marks received in course work. In the two white samples, dropouts also differed from graduates in parent's occupational and educational level, family size, marital status of parents, and tested arithmetic and language skill achievement. Although prediction was less accurate for dropouts than for graduates, at least six or seven of every ten dropouts were correctly identified by characteristics exhibited in the third grade. (For related document see CG008552). (Author)

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PREDICTION OF HIGH SCHOOL DROPOUT OR GRADUATION FROM 3RD GRADE DATA

Dee Norman Lloyd
and
Gail Bleach

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Summary

Measures of background characteristics, school performance, and tested achievement were analyzed for four race-by-sex samples of 3rd graders who were known to have later become high school dropouts or graduates.

Results showed that as early as five to eight years before leaving school, dropouts differed significantly from graduates in age, tested reading and IQ level and marks received in course work. In the two white samples, dropouts also differed from graduates in parent's occupational and educational level, family size, Marital Status of Parents, and tested arithmetic and language skill achievement.

A combination of six or fewer of the best predictors produced multiple correlations with dropout or graduation ranging from .49 to .55, and overall correct classification of dropouts and graduates by applying the multiple prediction equation to these samples was around 75%. Although prediction was less accurate for dropouts than for graduates, at least six or seven of every 10 dropouts were correctly identified by characteristics exhibited in the 3rd grade.

Tables of Contents

	Page
Summary	iii
Introduction	1
Method	2
Subjects	2
Variables	3
Procedures	5
Results	6
Correlations	6
Multiple Predictions	7
Combined Samples	11
Classification of Dropouts and Graduates	13
Discussion	15
References	20
Appendix	21

Tables

Page

Table 1: Zero-Order Correlations of 20 Elementary School Variables with Dropout-Graduation and Beta Coefficients and Multiple Correlations for Four Race-by-Sex Samples 8

Table 2: Zero-Order Correlations of 20 Elementary School Variables with Dropout-Graduation and Beta Coefficients with Multiple Correlations for Variables Increasing Total Variance Accounted for in Criterion More Than One Percent 10

Table 3: Zero-Order Correlations of Race, Sex and 20 Elementary School Variables with Dropout-Graduation and Beta Coefficients and Multiple Correlations for 4 and 11 Variable Equations: Combined Samples (N=1773) 12

Table 4: Number and Percentage of Dropouts and Graduates Classified by 3rd Grade Multiple Regression Equations 14

Table A: Correlation Matrix of 3rd Grade Variables: White Male Sample (N=788) 22

Table B: Correlation Matrix of 3rd Grade Variables: White Female Sample (N=774) 23

Table C: Correlation Matrix of 3rd Grade Variables: Negro Male Sample (N=109) 24

Table D: Correlation Matrix of 3rd Grade Variables: Negro Female Sample (N=102) 25

Page

Table E: Means and Standard Deviation on 3rd Grade Measures for Four Race-by-Sex Samples 26

Table F: Means and Standard Deviations for Dropouts and Graduates on 20 3rd Grade Measures (White Samples). . . 27

Table G: Means and Standard Deviations for Dropouts and Graduates on 20 3rd Grade Measures (Negro Samples). . . 28

Figure

Page

Figure 1: Relative Contributions of 3rd Grade Variables to the Prediction of Dropout or Graduation 17

Prediction of High School Dropout or Graduation from 3rd Grade Data

Dee N. Lloyd and Gail Bleach[1]

In a previous study, information gathered in the last year of elementary school was found to predict whether students would dropout or graduate from high school (Lloyd, 1967). That study revealed significant differences between dropouts and graduates on 20 measures, including classroom marks, standardized test scores, educational and occupational background of parents, marital status of parents, subject's age, and amount of absence in the 6th grade. A combination of these measures produced multiple correlations with dropout or graduation ranging between .48 and .65 in the various samples. Although it was anticipated that secordary school dropouts would show a history of difficulty that would extend back to elementary school, it was still surprising that the prediction would be so good from information taken from two to five years prior to the time that the majority withdrew from school. Using the weighted composite measure from the multiple regression equation, it was found that three out of four subjects were correctly predicted to either dropout or graduate.

If dropouts show distinguishing characteristics by the end of elementary school do these differences exist at an even earlier grade?

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[1]The authors wish to express appreciation to Mrs. Anita Green, statistical assistant, and to Miss Janet Modery and Mrs. Janet Moser, project secretaries, for their contributions to this study.

In order to investigate this possibility, 3rd grade data that was available for subjects in the original sample of 6th graders were coded and analyzed. The 3rd grade was chosen as a point for comparison because standardized tests are given at that grade level. The 3rd grade also stands out as an important point in educational process both from the design of educational curriculum and studies of achievement. It is the last of the primary grades, the point where basic reading skills have been taught (and hopefully learned), and the grade where it has been estimated that 50% of the future achievement patterns are set (Bloom, 1964).

The present study was directed at determining which characteristics of 3rd grade students would significantly differentiate high school graduates from dropouts and the degree of prediction that could be made from a combination of these characteristics.[2]

Method

Subjects

The four samples used in this investigation consisted of 788 white males, 774 white females, 109 Negro males, and 102 Negro females. Subjects were drawn from a larger population of 4,075

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[2]Three additional studies that use these same data are in preparation. The first concerns only the dropouts, and is directed at determining whether information in the 3rd grade will predict the grade in which dropouts will withdraw from school. This study parallels previous analyses done with 6th grade data (Lloyd, 1968). The second compares the findings of the 3rd grade and 6th grade studies. The final study in the series examines the observations made by 3rd grade teachers of social and classroom behavior and compares the future dropouts and graduates on ratings coded from these observations.

students that comprised the total regular enrollment of a county school system in the 6th grade. All subjects were followed to their transfer, withdrawal or graduation from high school. Graduation was determined by indications on the school permanent record cards and from lists of the graduating classes of the county high schools in the normal progression year from graduation. In addition, summer school and night school graduation lists and graduation lists from successive years were used to determine whether those subjects who had repeated grades eventually graduated.

Subjects in the study included only known dropouts and graduates. Students who transferred out of the school district prior to completing high school were excluded. The samples were further reduced to the dropouts and graduates who had complete information on variables that were used in the multiple correlation analyses.[3]

The number of dropouts and graduates in each of the samples was:

	Dropouts	Graduates
White Males	196	592
White Females	143	631
Negro Males	54	55
Negro Females	38	64

Variables

There were 20 3rd grade measures similar to those previously analyzed for the 6th grade. All variables were derived from information

[3]Almost all of the subjects (96%) in this study were also included in the 6th grade study, though the reverse was not true. Only 68% of the subjects in the 6th grade study were included in the 3rd grade samples.

contained on elementary school permanent record cards or classroom record sheets for standardized test scores.

Age in months in the 3rd grade (Age) was used largely as a measure of the number of non-promotions in elementary school. This variable also contained variance associated with age at first entering school. A dichotomized variable of regular progression vs. retention in one or more grades from the 1st to the 3rd grade (Retention) was also included as a measure of retention.

The educational level of both the father and the mother and the occupational level of the father as of the 3rd grade were used as measures of socioeconomic background. Education of Father and Education of Mother consisted of three categories: elementary, high school, and beyond high school. Occupation of Father consisted of seven categories adapted from the Occupational Scale of the Index of Social Position (Hollingshead and Redlich, 1958).[4] A summary of the seven occupational levels in this scale is as follows:

Level 1 - Higher executives, proprietors, and professionals.
Level 2 - Lesser executives, proprietors, and professionals.
Level 3 - Administrative, small business owners, minor and semi-professionals.
Level 4 - Clerical, sales, and technicians.
Level 5 - Skilled trades.
Level 6 - Semi-skilled trades.
Level 7 - Unskilled workers.

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[4]The coding of occupational level had a reverse correspondence to occupational status, so that lower means indicate higher levels. Correlations and Beta weights, however, have been reflected so that positive relationships are associated with higher occupational level.

The number of siblings of the subject (Siblings) and marital status of parents were measures of family characteristics. Siblings was coded directly. Marital Status of Parents was considered to be a gross measure of intact or broken homes. The two categories of the variable indicated (1) that the subject's natural parents were alive and married, or (2) that the natural parents were separated, divorced, deceased, or remarried.

Marks received in the 3rd grade subject areas of reading, language, spelling, arithmetic, and social studies; the average of these marks (Grade Point Average); and the number of days Absent in the 3rd grade (Absence) were used as a measure of school performance and behavior. Course marks were coded on a three-point scale representing below average, average, and above average performance as judged by the course teacher. Absence was coded on an eight category scale: 0-5, 6-10, 11-20, 21-30, 31-40, 41-60, 61-90, and more than 90 days absent.

The 3rd grade standardized test scores were the Total Mental Factors score from the California Test of Mental Maturity (CTMM IQ score), Primary Form, 1950 edition, and the Total Reading, Total Arithmetic, and Total Language scores from the California Achievement Test (CAT), Primary Battery, 1950 edition. The CAT scores were grade-equivalent scores.

Procedures

Multiple regression analyses were performed within each race by

sex sample.[5] A multiple correlation was also computed with the four samples combined. In this analysis Race and Sex were included with the other 20 independent variables in order to determine whether they would account for variance in the criterion that was independent of that accounted for by other measures.

The criterion for prediction was a group membership variable, with secondary school dropouts coded as 2 and high school graduates coded as 3.

Results

Correlations

In the white samples, 18 of the 20 independent variables had significant correlations with dropout or graduation. In the Negro samples, nine of the 20 variables had significant correlations.

The variables that were among those with the highest correlations in one or more sample and that were significantly related to the criterion in all four samples were CTMM IQ score, CAT-Reading, Retention, and Grade Point Average.

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[5]Analyses were computed by means of the IBM 360 computer version of the BMD02R stepwise regression program (Dixon, 1965.) This program successively adds variables to the multiple linear regression equation. The variable with the highest correlation with the criterion is selected first. At each additional step, the variable having the highest partial correlation with the criterion, partialling out the contribution of all variables previously entered, is selected. This procedure continues until all variables have entered the equation or until a specified level of significance for adding variables is reached. The program provides b weights for variables. The beta weights reported were calculated from the standard deviations and b weights given in the computer computations. Appreciation is expressed to Mr. Steward Teper of the computer facility at the National Institute of Mental Health for his assistance in programming and supervising the computer analyses.

The measures of family characteristics were significantly related to the criterion in both white samples, however, with one exception, they did not have significant correlations in the Negro samples. Only Occupation of Father had a significant relation to dropout or graduation in the Negro male sample.

Absence was the only variable that did not have a significant correlation with dropout or graduation in any sample.

All significant correlations were in the expected direction, with graduation from high school associated with younger age, higher occupational and educational levels, fewer siblings, more intact homes, higher course marks and standardized test scores, and fewer retentions between the 1st and 3rd grades. Correlations with the criterion are presented in Table 1. The intercorrelation matrices, means, and standard deviations for the independent variables are presented in Tables A through G in the Appendix.

Multiple Predictions

Multiple regression equations produced correlations that were substantially higher than the highest zero-order correlations in each of the samples. Eight variables had significant beta weights ($p < .05$) in the white male sample; seven variables had significant beta weights in the white female sample. The obtained multiple correlations for white males and white females, respectively, were .511 and .493.

The multiple correlations obtained in the two Negro samples were slightly higher and were achieved with fewer variables than in the white samples. Three variables had significant beta weights in

Table 1

Zero-Order Correlations of 20 Elementary School Variables with Dropout-Graduation and Beta Coefficients and Multiple Correlations for Four Race-by-Sex Samples

	Variable	White Males (N=788)		White Females (N=774)		Negro Males (N-109)		Negro Females (N=102)	
		r	Beta	r	Beta	r	Beta	r	Beta
1	Age in 3rd grade	-.308	-.1929	-.191		-.435		-.330	
2	Age in 1st grade	-.168		.061[a]		-.082[a]		-.053[a]	
3	Education of father	.223		.238		.138[a]		.032[a]	
4	Education of mother	.242		.267	.1250	.167[a]		.185[a]	
5	Siblings	-.255	-.1283	-.273	-.1468	-.079[a]		-.190[a]	
6	Marital status of parents	-.124	-.0799	-.166	.1235	-.004[a]		-.070[a]	
7	Occupation of father	.213	.0840	.182		.285	.2122	.121[a]	
8	3rd mark - reading	.301		.349	.1490	.284	.1901	.343	
9	3rd mark - language	.310		.275		.324		.379	
10	3rd mark - spelling	.312		.328		.195		.361	
11	3rd mark - writing	.209		.179		.138[a]		.377	.1940
12	3rd mark - arithmetic	.264		.265		.149[a]		.410	.2149
13	3rd mark - social studies	.257		.246		.274		.365	
14	3rd grade point average	.351	.1154	.296		.282		.430	
15	Absence	-.064[a]	-.0840	-.066[a]		-.180[a]		-.194[a]	
16	Retention	-.269		-.267	-.1281	-.452	-.4015	-.448	-.3269
17	3rd CAT - reading	.367	.1345	.339		.278		.421	
18	3rd CAT - arithmetic	.358		.319	.0971	.175[a]		.384	
19	3rd CAT - language	.296		.268		.155[a]		.377	
20	3rd CTMM IQ score	.366	.1213	.323	.0991	.368		.221	
	Multiple correlation		.5095		.4932		.5437		.5550
	Multiple correlation squared		.2595		.2433		.2956		.3080
	Standard error of estimate		.3741		.3394		.4275		.4103

[a]Not significant at the .05 level.

both the Negro male and Negro female sample, producing multiple correlations of .544 and .555. The beta weights and multiple correlations for equations containing all the variables significant at the .05 confidence level are presented in Table 1.

In the white male sample, a statistical peculiarity occurred. Absence, which did not correlate significantly with the criterion, entered the prediction equation and had a significant beta weight. If we accept that the correlation with dropout or graduation was a chance deviation and that its true correlation was zero, it would be contradictory to accept the contribution of this variable to the multiple prediction as other than a statistical artifact. The equation of the first six variables (not including Absence and Occupation of Father) produced a multiple correlation of .497. Therefore, exclusion of Absence from the prediction equation would not alter the findings substantially.

For practical application, it is desirable to have an equation with as few variables as possible and still maintain adequate prediction. Because of the large sample size for white males and white females, some variables had statistically significant beta weights even though they added little to the overall prediction. Therefore, the equations containing only variables that added more than 1% to the total variance accounted for in the criterion were examined to determine which variables were the major predictors. These equations are presented in Table 2. (In the Negro samples, all variables with

Table 2

Zero-Order Correlations of 20 Elementary School Variables with Dropout-Graduation and Beta Coefficients and Multiple Correlations for Variables Increasing Total Variance Accounted for in Criterion More Than One Percent

	Variable	White Males (N=788)		White Females (N=774)	
		r	Beta	r	Beta
1	Age in 3rd grade	-.308	-.2054	-.191	
2	Age in 1st grade	-.168		.061[a]	
3	Education of father	.223		.238	
4	Education of mother	.242		.267	.1250
5	Siblings	-.255	-.1194	-.273	-.1494
6	Marital status of parents	-.124		-.166	-.1240
7	Occupation of father	.213		.182	
8	3rd mark - reading	.301		.349	.1906
9	3rd mark - language	.310		.275	
10	3rd mark - spelling	.312		.328	
11	3rd mark - writing	.209		.179	
12	3rd mark - arithmetic	.264		.265	
13	3rd mark - social studies	.257		.246	
14	3rd grade point average	.351	.1377	.296	
15	Absence	-.064[a]		-.066[a]	
16	Retention	.269		-.267	-.1263
17	3rd CAT - reading	.367	.1389	.339	
18	3rd CAT - arithmetic	.358		.319	
19	3rd CAT - language	.296		.268	
20	3rd CTMM IQ score	.366	.1265	.323	.1325
	Multiple correlation		.4895		.4877
	Multiple correlation squared		.2396		.2379
	Standard error of estimate		.3784		.3403

[a]Not significant at the .01 level.

significant beta weights also contributed more than 1% to the total variance accounted for in the criterion.)

Five variables in the white male sample and six variables in the white female sample added substantial variance to the prediction of dropout or graduation. The multiple correlations for these equations were only slightly smaller than those obtained with eight variables. Comparing total variance accounted for between dropouts and graduates (multiple correlations squared), it can be seen that the shorter equation accounted for only 2% less variance in the white male sample and only .05% less variance in the white female sample.

Combined Samples

The results of the stepwise multiple regression analysis for all samples combined are presented in Table 3. Although 11 variables had significant beta weights ($p. < .001$), only four variables accounted for more than 1% of the variance in the criterion. These four variables in order of their relative contribution to the equation were the CAT Reading score, Age, Grade Point Average, and Siblings. The multiple correlation for the equation (.488) was approximately the same as obtained in the two white samples, but was lower than the coefficients in the Negro samples. The four variable equation contained four of the five variables that accounted for the most variance in the white male sample. The 11 variable equation represented a combination of almost all predicting variables in the four subsamples.

Table 3

Zero-Order Correlations of Race, Sex and 20 Elementary School Variables with Dropout-Graduation and Beta Coefficients and Multiple Correlations for 4 and 11 Variable Equations: Combined Samples (N = 1773)

	Variables	r	Betas for 4 Variables[a]	Betas for 11 Variables[b]
	Race	-.165		
	Sex	.084		
1	Age in 3rd grade	-.308	-.2099	-.1094
2	Age in 1st grade	-.120		
3	Education of father	.251		
4	Education of mother	.279		.0711
5	Siblings	-.282	-.1597	-.1175
6	Marital status of parents	-.136		-.0766
7	Occupation of father	.239		.0489
8	3rd mark-reading	.330		
9	3rd mark-language	.312		.0668
10	3rd mark-spelling	.323		.0811
11	3rd mark-writing	.211		
12	3rd mark-arithmetic	.273		
13	3rd mark-social studies	.266		
14	3rd grade point average	.334	.1450	
15	Absence	-.068		-.0869
16	Retention	-.330		-.1183
17	3rd CAT-reading	.384	.2092	.1267
18	3rd CAT-arithmetic	.360		
19	3rd CAT-language	.303		
20	3rd CTMM IQ score	.368		.0831
Multiple correlation			.4882	.5291
Multiple correlation squared			.2383	.2799
Standard error of estimate			.3749	.3652

[a] Variables increasing total variance accounted for in criterion more than 1%.

[b] Maximum number of variables with significant beta weights ($p < .01$).

The similarity in predictors and amount of prediction between the combined samples and the individual white samples suggested that the single equation might serve as well for white males and females. There would be a loss in the prediction for Negro subjects, however, by using a single, general equation.[6]

Sex and race both correlated significantly with the criterion. This simply reflected the fact that more Negros than whites and more males than females became dropouts. However, since neither sex nor race entered the multiple regression equation with a significant beta weight, it can be inferred that the relationships between being male or being Negro and dropping out of school were accounted for by other variables in the equation.

Classification of Dropouts and Graduates

Taking the score for each subject on the composite predictive measure (based on the weighted scores of variables in the regression equation) and dividing the distribution of scores at a point equidistant from the mean score of the dropouts and the graduates, the accuracy of the prediction equation that classified dropouts and graduates can be seen in terms of the number of subjects correctly and incorrectly classified. These classifications are given in Table 4.

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[6] Comparing the multiple correlations of the individual samples with the expected chance deviation of the combined sample correlation revealed that the multiple correlations for the white samples fell within the .01 confidence limits of the combined-sample correlation (.442 to .535). The equations that were specific to the Negro Male and Negro female samples, however, were higher than these limits.

Table 4

Number and Percentage of Dropouts and Graduates Classified by 3rd Grade Multiple Regression Equations

Group	Classified as Dropout		Classified as Graduate		Overall Correct Classification
White Males					
Dropouts (N=196)	136	69.4	60	30.6	76.4%
Graduates (N=592)	126	21.3	466	78.7	
White Females					
Dropouts (N=143)	94	65.7	49	34.3	77.1%
Graduates (N=631)	128	20.3	503	79.7	
Negro Males					
Dropouts (N=54)	33	61.1	21	38.9	72.5%
Graduates (N=55)	9	16.4	46	83.6	
Negro Females					
Dropouts (N=38)	21	55.3	17	44.7	76.5%
Graduates (N=64)	7	10.9	57	89.1	

The degree to which a dropout or graduate could be predicted from 3rd grade data was sizable. Overall, three out of four subjects were correctly predicted to either dropout or graduate from the 3rd grade measures. The classification was better for graduates than for dropouts. This indicated that there were more dropouts with characteristics that would lead to the prediction of graduation in the 3rd grade than there were graduates who had characteristics of dropouts. Concentraing only on dropouts, it can be seen that six or seven of every ten dropouts were correctly classified by the 3rd grade measures.[7]

Discussion

The findings showed that a surprisingly large number of characteristics differentiated dropouts and graduates as early as the 3rd grade. In addition, it was found that a combination of variables would predict dropout or graduation. This indicated that there was not just one factor that accounted for differences in the early educational adjustment of dropouts and graduates; rather, several independent indicators were associated with future success or failure.

In order to assess comparability of the findings across samples, it is necessary to consider that the multiple regression technique

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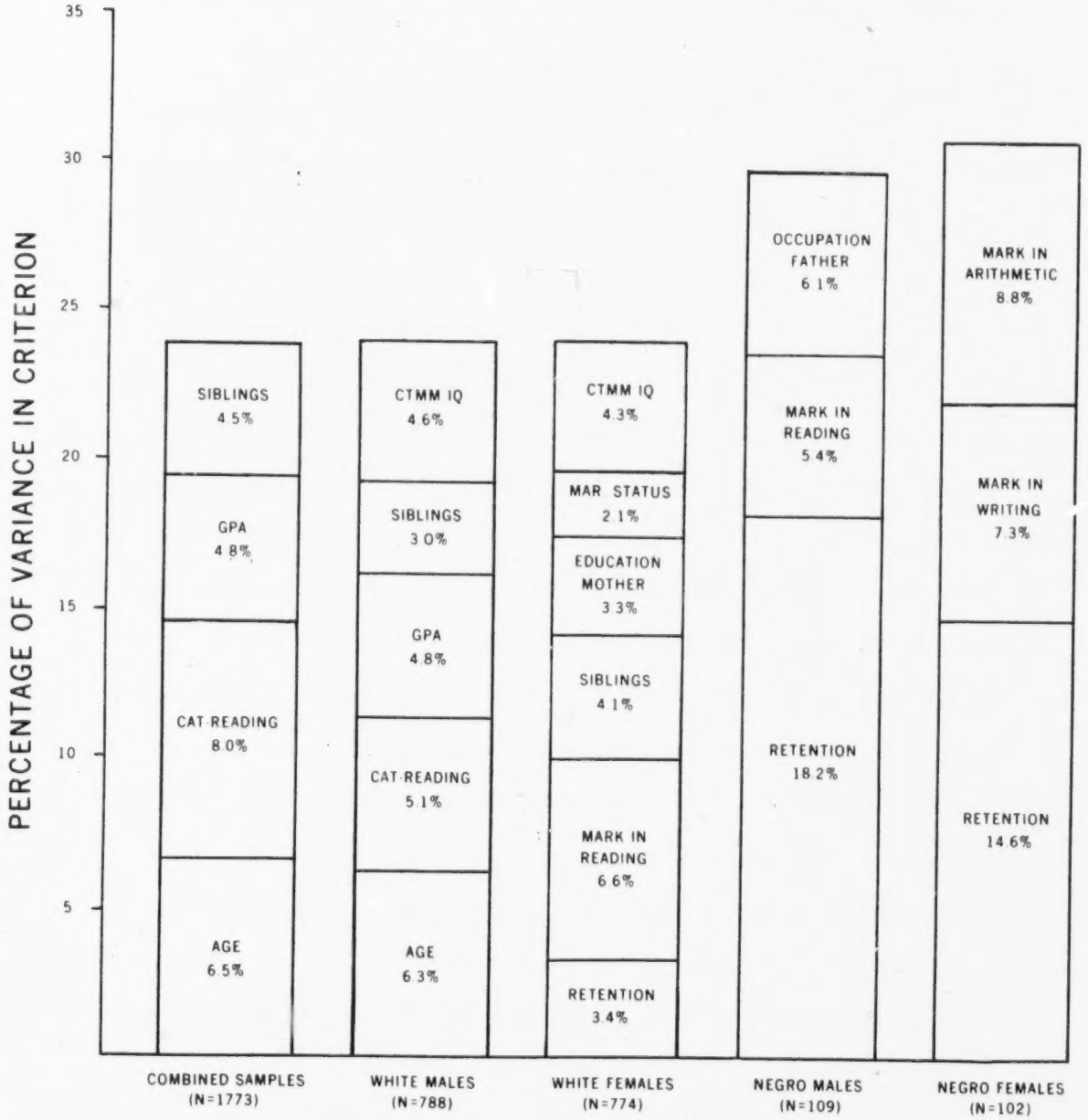
[7] In application, the cutoff point for prediction can be moved anywhere along the distribution of composite scores to maximize the correct classification of one or the other group. For example, only 6% of the graduates had scores that were lower than the mean score of the dropout group. And, only 13% of the dropouts had scores which were higher than the mean score of graduates.

is mechanical, and only the highest correlations or partial correlations are selected to enter equations. Also, correlations for measures of the same characteristics may vary in size within a sample, although the measures may not truly differ in their relationship to dropout or graduation in the population. The correlation of Age and Retention with the criterion may not be significantly different from each other, but Age had a higher correlation in the white male sample than Retention and, therefore, entered the equation. In the other samples, however, the correlation of Retention with the criterion was higher than that of Age and entered the equations. In the white female samples Mark in Reading entered the predictive equation, but its correlation was only slightly higher than the CAT Reading score, which was the achievement variable in the equation of white male sample. In our previous study (Lloyd, 1967), it was demonstrated that similar measures would substitute for each other in prediction equations and combine with other variables to produce similarly high predictions. So, although the specific predictors differed in the samples, there was a greater similarity in the results than would be seen initially. In Figure 1, the relative contribution of variables to the equations in each sample is illustrated. The variables are ordered from bottom to top according to the similarity in content of the measures.

In general, the major independent predictors of dropout or graduation for each sample were: non-promotion in one of the first

FIGURE 1
RELATIVE CONTRIBUTION OF 3RD GRADE VARIABLES TO THE PREDICTION OF DROPOUT OR GRADUATION



three school grades (Age and Retention), reading achievement (test score or course mark), a measure of classroom performance (Grade Point Average or a specific course mark), and a measure of family background (Siblings or Occupation of Father).

Only a few differences among the samples did not reflect an underlying similarity in the characteristics being measured. The correlations of reading achievement measures with dropout or graduation in the Negro female sample were almost as high as other predictive measures; however, they did not combine with other measures in the multiple regression equation for that sample. Also, in the Negro samples, unlike the white samples, SES and family characteristics were not significantly related to the dropout or graduation, with the exception of Occupation of Father in the Negro male sample.

There were also some differences among samples in the relative contribution of predictors; two of these differences appeared to be related to sex. Among white females, more family background measures were major predictors than in other samples. In the white male sample, family background measures also predicted dropout or graduation; however, they contributed much smaller amounts of variance to the prediction (see Table 1). Occupation of Father was predictive of future dropout or graduation for males of both races, but not for females. Arithmetic achievement in the 3rd grade was more predictive for females than for males. In the Negro female sample, this was the course mark in Arithmetic; for white females, the CAT Arithmetic had a small contribution to the prediction (see Table 1).

Although replication of the prediction with different samples is in order, particularly since most of the subjects in this study were also in the samples used to predict dropout or graduation from 6th grade data, the degree of prediction was high enough that it would not be expected to disappear with replication. The finding that the majority of dropouts, between 60% and 70%, showed difficulties as early as the 3rd grade that eventually led to dropout has two important implications. First, it seems apparent that the factors that eventually lead to failure and withdrawal before completion of high school education develop from the very beginning of a student's association with the school system, with some even earlier antecedents. More importantly, especially for those whose efforts are directed at maximizing the educational development of children in the school system, these difficulties are detectable at least as far back as the 3rd grade.

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Appendix

Intercorrelation Matrices, Means and Standard Deviations on 3rd Grade Variables

Following is the key for identifying variables in Tables A through D:

Number	Variables
1	Age 3rd grade
2	Age 1st grade
3	Education of father
4	Education of mother
5	Number of siblings
6	Married/other
7	Occupation of father
8	3rd mark - reading
9	3rd mark - language
10	3rd mark - spelling
11	3rd mark - writing
12	3rd mark - arithmetic
13	3rd mark - social studies
14	Grade point average 3rd grade
15	Absence
16	Retained/not retained
17	CAT-reading total
18	CAT-arithmetic total
18	CAT-language total
20	IQ CTMM

TABLE A

CORRELATION MATRIX OF 3RD GRADE VARIABLES: WHITE MALE SAMPLE (N=788)

VARIABLE NUMBER	1	2	3	4	5	6	7	8	9	10
1	1.000	0.774	-0.147	-0.173	0.178	0.087	0.120	-0.143	-0.160	-0.124
2		1.000	-0.068	-0.081	0.056	0.094	0.050	-0.005	-0.041	0.013
3			1.000	0.577	-0.186	0.028	-0.565	0.262	0.251	0.217
4				1.000	-0.240	0.025	-0.420	0.286	0.254	0.290
5					1.000	-0.027	0.118	-0.197	-0.208	-0.195
6						1.000	0.132	-0.055	-0.053	-0.053
7							1.000	-0.248	-0.197	-0.189
8								1.000	0.589	0.720
9									1.000	0.581
10										1.000

VARIABLE NUMBER	11	12	13	14	15	16	17	18	19	20
1	-0.106	-0.092	-0.105	-0.157	-0.004	0.528	-0.160	-0.112	-0.160	-0.293
2	0.007	0.060	0.015	0.014	0.060	-0.089	-0.003	0.037	-0.033	-0.113
3	0.133	0.183	0.233	0.279	0.029	-0.121	0.291	0.277	0.273	0.259
4	0.144	0.207	0.222	0.296	0.004	-0.146	0.291	0.260	0.260	0.281
5	-0.119	-0.172	-0.217	-0.233	-0.080	0.206	-0.244	-0.219	-0.171	-0.265
6	-0.012	-0.066	-0.077	-0.080	0.003	0.018	-0.025	-0.032	-0.086	-0.056
7	-0.119	-0.149	-0.205	-0.235	-0.092	0.118	-0.251	-0.224	-0.214	-0.219
8	0.388	0.578	0.546	0.794	0.038	-0.216	0.708	0.601	0.559	0.456
9	0.401	0.490	0.553	0.724	-0.011	-0.188	0.496	0.426	0.435	0.346
10	0.495	0.598	0.534	0.799	0.005	-0.197	0.615	0.579	0.502	0.417
11	1.000	0.470	0.419	0.633	-0.028	-0.162	0.390	0.378	0.329	0.273
12		1.000	0.526	0.748	-0.054	-0.212	0.520	0.582	0.444	0.437
13			1.000	0.772	-0.002	-0.187	0.486	0.472	0.397	0.367
14				1.000	-0.026	-0.250	0.666	0.629	0.558	0.478
15					1.000	-0.085	0.007	-0.005	0.004	0.033
16						1.000	-0.238	-0.199	-0.204	-0.295
17							1.000	0.791	0.672	0.583
18								1.000	0.634	0.648
19									1.000	0.466
20										1.000

TABLE B

CORRELATION MATRIX OF 3RD GRADE VARIABLES: WHITE FEMALE SAMPLE (N=774)

VARIABLE NUMBER	1	2	3	4	5	6	7	8	9	10
1	1.000	0.812	-0.114	-0.168	0.154	0.053	0.106	-0.082	-0.034	-0.037
2		1.000	-0.075	-0.115	0.064	0.042	0.073	0.034	0.047	0.057
3			1.000	0.510	-0.278	-0.092	-0.547	0.236	0.212	0.222
4				1.000	-0.277	-0.061	-0.366	0.237	0.255	0.213
5					1.000	-0.020	0.159	-0.194	-0.162	-0.182
6						1.000	0.066	-0.101	-0.115	-0.107
7							1.000	-0.226	-0.198	-0.174
8								1.000	0.626	0.735
9									1.000	0.651
10										1.000

VARIABLE NUMBER	11	12	13	14	15	16	17	18	19	20
1	-0.001	-0.040	-0.004	-0.012	-0.010	0.447	-0.076	-0.072	-0.063	-0.248
2	0.063	0.089	0.039	0.090	-0.028	-0.067	0.024	0.018	-0.012	-0.111
3	0.126	0.183	0.217	0.259	0.010	-0.115	0.229	0.201	0.201	0.239
4	0.142	0.177	0.207	0.259	-0.036	-0.148	0.220	0.181	0.192	0.216
5	-0.104	-0.107	-0.110	-0.178	-0.045	0.193	-0.198	-0.183	-0.166	-0.227
6	-0.038	-0.074	-0.121	-0.093	0.021	0.049	-0.089	-0.079	-0.079	-0.093
7	-0.140	-0.180	-0.165	-0.227	-0.036	0.117	-0.209	-0.189	-0.155	-0.207
8	0.420	0.592	0.523	0.714	-0.007	-0.250	0.705	0.575	0.541	0.424
9	0.430	0.516	0.603	0.696	-0.002	-0.189	0.547	0.456	0.450	0.408
10	0.514	0.634	0.542	0.730	-0.008	-0.206	0.619	0.541	0.507	0.413
11	1.000	0.445	0.431	0.573	-0.029	-0.154	0.351	0.334	0.294	0.243
12		1.000	0.522	0.668	-0.020	-0.240	0.531	0.555	0.428	0.412
13			1.000	0.693	0.011	-0.122	0.456	0.444	0.373	0.350
14				1.000	-0.026	-0.222	0.600	0.535	0.504	0.396
15					1.000	0.009	-0.023	-0.031	-0.037	0.007
16						1.000	-0.210	-0.195	-0.129	-0.296
17							1.000	0.737	0.694	0.521
18								1.000	0.636	0.525
19									1.000	0.410
20										1.000

TABLE C

CORRELATION MATRIX OF 3RD GRADE VARIABLES: NEGRO MALE SAMPLE (N=109)

VARIABLE NUMBER	1	2	3	4	5	6	7	8	9	10
1	1.000	0.506	-0.029	0.031	0.077	0.136	0.134	-0.187	-0.306	-0.132
2		1.000	0.021	0.053	0.116	-0.000	-0.007	-0.030	-0.003	-0.013
3			1.000	0.393	-0.151	0.108	-0.085	-0.016	-0.043	-0.150
4				1.000	-0.205	-0.023	-0.049	0.066	0.083	0.154
5					1.000	-0.299	-0.082	0.083	0.148	0.034
6						1.000	0.074	-0.140	-0.100	-0.099
7							1.000	-0.161	-0.177	-0.208
8								1.000	0.719	0.760
9									1.000	0.619
10										1.000

VARIABLE NUMBER	11	12	13	14	15	16	17	18	19	20
1	-0.163	-0.144	-0.229	-0.229	0.110	0.738	-0.149	-0.124	-0.076	-0.466
2	0.051	-0.069	-0.051	0.024	0.044	-0.115	0.064	-0.009	0.073	-0.122
3	-0.007	-0.164	0.032	-0.047	-0.068	0.003	-0.191	-0.211	-0.137	-0.029
4	0.054	0.060	0.261	0.155	-0.148	0.037	0.036	0.112	0.069	0.005
5	0.010	0.182	0.008	0.122	-0.108	0.027	0.036	0.037	-0.043	0.006
6	-0.089	-0.067	-0.175	-0.140	0.119	0.088	-0.180	-0.099	-0.129	0.014
7	-0.159	-0.090	-0.055	-0.198	0.030	0.105	-0.180	-0.059	-0.131	-0.236
8	0.380	0.602	0.519	0.814	-0.046	-0.148	0.539	0.477	0.416	0.298
9	0.457	0.555	0.550	0.823	-0.166	-0.325	0.533	0.487	0.487	0.377
10	0.411	0.580	0.448	0.791	-0.057	-0.128	0.465	0.473	0.424	0.317
11	1.000	0.182	0.327	0.606	-0.053	-0.186	0.253	0.092	0.125	0.243
12		1.000	0.435	0.716	-0.069	-0.071	0.380	0.513	0.358	0.232
13			1.000	0.731	-0.196	-0.204	0.359	0.465	0.301	0.301
14				1.000	-0.148	-0.228	0.508	0.503	0.421	0.383
15					1.000	0.080	-0.011	-0.032	-0.091	-0.116
16						1.000	-0.237	-0.186	-0.133	-0.398
17							1.000	0.690	0.611	0.434
18								1.000	0.667	0.372
19									1.000	0.321
20										1.000

TABLE D

CORRELATION MATRIX OF 3RD GRADE VARIABLES: NEGRO FEMALE SAMPLE (N=102)

VARIABLE NUMBER	1	2	3	4	5	6	7	8	9	10
1	1.000	0.705	-0.129	-0.106	0.184	0.157	0.118	-0.492	-0.511	-0.465
2		1.000	-0.094	-0.010	0.115	-0.022	0.018	-0.242	-0.230	-0.290
3			1.000	0.676	-0.326	-0.106	-0.447	0.123	0.063	0.093
4				1.000	-0.483	0.118	-0.303	0.225	0.098	0.206
5					1.000	-0.133	0.179	-0.156	-0.115	-0.106
6						1.000	0.027	-0.169	-0.151	-0.031
7							1.000	-0.379	-0.152	-0.033
8								1.000	0.596	0.637
9									1.000	0.646
10										1.000

VARIABLE NUMBER	11	12	13	14	15	16	17	18	19	20
1	-0.402	-0.401	-0.387	-0.536	0.074	0.666	-0.497	-0.437	-0.443	-0.495
2	-0.296	-0.235	-0.175	-0.311	0.061	0.010	-0.177	-0.193	-0.250	-0.307
3	0.200	0.198	0.151	0.216	-0.106	-0.106	0.132	0.126	0.057	0.238
4	0.222	0.253	0.167	0.263	-0.031	-0.144	0.185	0.095	0.087	0.206
5	-0.237	-0.070	-0.083	-0.173	0.082	0.178	-0.149	-0.117	-0.168	-0.210
6	0.030	-0.034	-0.044	-0.066	-0.081	0.239	-0.078	-0.118	-0.029	-0.101
7	-0.158	-0.218	-0.034	-0.130	-0.082	0.200	-0.169	-0.124	-0.099	-0.400
8	0.448	0.627	0.528	0.776	-0.010	-0.457	0.687	0.610	0.620	0.472
9	0.480	0.585	0.639	0.807	0.007	-0.492	0.489	0.586	0.459	0.298
10	0.501	0.618	0.588	0.758	-0.051	-0.348	0.567	0.545	0.495	0.253
11	1.000	0.455	0.564	0.708	-0.119	-0.261	0.437	0.420	0.392	0.330
12		1.000	0.559	0.762	0.016	-0.327	0.507	0.573	0.439	0.408
13			1.000	0.820	-0.062	-0.312	0.415	0.472	0.398	0.212
14				1.000	-0.053	-0.421	0.605	0.638	0.553	0.415
15					1.000	0.084	-0.057	-0.064	-0.032	0.007
16						1.000	-0.470	-0.392	-0.330	-0.393
17							1.000	0.791	0.774	0.626
18								1.000	0.739	0.569
19									1.000	0.471
20										1.000

Table E

Means and Standard Deviations on 3rd Grade Measures for Four Race by Sex Samples

	Variable	White Males (N=788) Mean	S.D.	White Females (N=774) Mean	S.D.	Negro Males (N=109) Mean	S.D.	Negro Females (N=102) Mean	S.D.
1	Age in 3rd grade	100.04	5.17	99.04	4.50	103.43	7.87	101.06	7.4
2	Age in 1st grade	75.17	4.27	74.52	4.34	75.83	4.92	74.82	4.8
3	Education of father	2.04	.66	1.99	.68	1.18	.39	1.39	.5
4	Education of mother	2.03	.60	2.00	.59	1.30	.48	1.51	.5
5	Siblings	1.97	1.54	1.99	1.57	4.52	2.28	4.52	2.3
6	Marital status of parents	1.06	.23	1.07	.26	1.17	.37	1.13	.3
7	Occupation of father	4.26	1.54	4.26	1.50	5.99	1.07	5.99	1.2
8	3rd mark - reading	1.98	.69	2.24	.64	1.87	.65	2.23	.6
9	3rd mark - language	1.99	.57	2.17	.53	1.90	.54	2.15	.5
10	3rd mark - spelling	2.00	.64	2.24	.63	1.83	.72	2.28	.6
11	3rd mark - writing	2.03	.54	2.21	.50	2.01	.60	2.26	.5
12	3rd mark - arithmetic	2.07	.58	2.12	.57	1.94	.68	2.06	.6
13	3rd mark - social studies	2.08	.46	2.15	.56	2.02	.47	2.13	.4
14	3rd grade point average	2.05	.36	2.17	.40	1.98	.36	2.17	.3
15	Absence	2.59	1.12	2.75	1.17	2.49	1.30	2.43	1.3
16	Retention	1.07	.25	1.04	.19	1.25	.43	1.16	.3
17	3rd CAT - reading	3.73	.95	4.11	.82	3.10	.80	3.56	.8
18	3rd CAT - arithmetic	3.98	.72	4.11	.65	3.46	.78	3.70	.8
19	3rd CAT - language	3.57	.73	3.83	.66	3.27	.78	3.64	.7
20	3rd CTMM IQ score	108.78	16.24	108.98	15.09	92.51	15.23	93.62	17.6

Table F

Means and Standard Deviations for Dropouts and Graduates
on 20 3rd Grade Measures (White Samples)

		White Males				White Females			
		Dropouts (N-196)		Graduates (N=592)		Dropouts (N=143)		Graduates (N=631)	
	Variable	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D
1	Age in 3rd grade	102.80	6.79	99.13	4.12	100.84	5.72	98.63	4.0
2	Age in 1st grade	76.41	5.13	74.76	3.86	75.08	4.43	74.39	4.3
3	Education of father	1.78	.65	2.12	.64	1.65	.60	2.07	.6
4	Education of mother	1.78	.62	2.11	.57	1.67	.51	2.08	.5
5	Siblings	2.65	1.87	1.74	1.34	2.89	2.06	1.78	1.3
6	Marital status of parents	1.11	.31	1.04	.20	1.16	.37	1.05	.2
7	Occupation of father	4.83	1.19	4.07	1.60	4.83	1.27	4.13	1.5
8	3rd mark - reading	1.62	.63	2.09	.66	1.76	.64	2.34	.6
9	3rd mark - language	1.68	.54	2.09	.54	1.86	.54	2.24	.5
10	3rd mark - spelling	1.66	.63	2.12	.59	1.81	.60	2.34	.5
11	3rd mark - writing	1.83	.54	2.09	.52	2.03	.47	2.26	.4
12	3rd mark - arithmetic	1.80	.55	2.15	.56	1.80	.60	2.19	.5
13	3rd mark - social studies	1.87	.43	2.15	.45	1.91	.44	2.20	.4
14	3rd grade point average	1.83	.34	2.12	.33	1.92	.33	2.23	.3
15	Absence	2.71	1.29	2.54	1.06	2.91	1.22	2.71	1.1
16	Retention	1.19	.39	1.03	.17	1.15	.36	1.01	.1
17	3rd CAT - reading	3.12	.93	3.93	.87	3.52	.85	4.24	.7
18	3rd CAT - arithmetic	3.53	.78	4.13	.64	3.67	.73	4.21	.5
19	3rd CAT - language	3.20	.70	3.70	.69	3.46	.69	3.92	.6
20	3rd CTMM IQ score	98.47	17.95	112.19	14.07	98.74	15.20	111.31	14.0

Table G

Means and Standard Deviations for Dropouts and Graduates
on 20 3rd Grade Measures (Negro Samples)

	Variable	Negro Males				Negro Females			
		Dropouts (N=54)		Graduates (N=55)		Dropouts (N=38)		Graduates (N=64)	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D
1	Age in 3rd grade	106.87	8.81	100.05	4.93	104.21	9.45	99.19	5.0
2	Age in 1st grade	76.24	5.50	75.44	4.29	75.16	5.67	74.62	4.3
3	Education of father	1.13	.34	1.24	.43	1.37	.59	1.41	.5
4	Education of mother	1.22	.42	1.38	.53	1.37	.49	1.59	.6
5	Siblings	4.70	2.15	4.35	2.41	5.11	2.33	4.17	2.3
6	Marital status of parents	1.17	.38	1.16	.37	1.16	.37	1.11	.3
7	Occupation of father	6.30	.82	5.69	1.20	6.18	1.35	5.88	1.1
8	3rd mark - reading	1.69	.64	2.05	.62	1.92	.75	2.41	.5
9	3rd mark - language	1.72	.53	2.07	.50	1.87	.62	2.31	.4
10	3rd mark - spelling	1.69	.70	1.96	.72	1.97	.68	2.47	.5
11	3rd mark - writing	1.93	.64	2.09	.55	2.00	.52	2.42	.5
12	3rd mark - arithmetic	1.83	.67	2.04	.69	1.71	.61	2.27	.6
13	3rd mark - social studies	1.89	.42	2.15	.49	1.92	.36	2.25	.4
14	3rd grade point average	1.88	.33	2.08	.37	1.96	.33	2.30	.3
15	Absence	2.72	1.34	2.25	1.24	2.76	1.60	2.23	1.0
16	Retention	1.44	.50	1.05	.23	1.37	.49	1.03	.1
17	3rd CAT - reading	2.87	.77	3.32	.78	3.07	.98	3.84	.6
18	3rd CAT - arithmetic	3.32	.70	3.59	.84	3.29	.87	3.95	.7
19	3rd CAT - language	3.15	.76	3.39	.80	3.27	.81	3.86	.6
20	3rd CTMM IQ score	86.89	14.01	98.04	14.44	88.58	20.66	96.61	14.9